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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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KOSOWSKI, ALEXANDER J	
ART UNIT	**PAPER NUMBER**
2125	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/085,829	STEWART, EDWARD C.
	Examiner	Art Unit
	Alexander J Kosowski	2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 28 February 2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 28 February 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1) Claims 1-26 are presented for examination.

Claim Rejections - 35 USC § 103

2) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3) Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicholson (U.S. Pat 6,701,204), further in view of Tripathi et al (U.S. PGPUB 2003/0083754).

Referring to claim 1, Nicholson teaches a method comprising detecting a fault associated with processing of a workpiece in a manufacturing system having a plurality of processing tools (col. 1 lines 24-40), identifying at least one of the processing tools that processes the workpiece (col. 3 lines 13-21), and providing an error signal to an operator to perform diagnostics based on the detected fault (col. 3 lines 50-52). However, Nicholson does not explicitly teach providing an error signal to the identified processing tool to perform diagnostics based on the detected fault.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to the at least one identified processing tools to perform

diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 2, Nicholson teaches the method above. However, Nicholson does not explicitly teach that each of the processing tools comprises an associated equipment interface, wherein providing the error signal comprises providing the error signal to the equipment interface of the at least one of the identified processing tools.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to an equipment interface of the at least one identified processing tools to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 3, Nicholson teaches performing corrective action based on performing diagnostics (col. 3 lines 50-52).

Referring to claim 4, Nicholson teaches that the corrective action comprises performing the corrective action based on a classification of the fault (col. 3 lines 5-11 and 50-52).

Referring to claim 5, Nicholson teaches the above. However, Nicholson does not explicitly teach that detecting the fault comprises receiving operation data from one or more of the identified processing tools and comparing the operational data to fault model data.

Tripathi teaches monitoring a processing tool for status information in order to monitor for faults (Paragraph 0036).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the process tool monitoring of Tripathi in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 6, Nicholson teaches identifying the at least one of the processing tools comprises accessing a history module including a list of one or more of the plurality of the processing tools that processes the workpiece (col. 1 lines 36-39 and col. 3 lines 12-21).

Referring to claim 7, Nicholson teaches that detecting the fault comprises receiving metrology data and determining that at least a portion of the metrology data is not within an acceptable range (col. 1 lines 27-33).

Referring to claim 8, Nicholson teaches a storage unit (col. 2 lines 57-63), and a control unit adapted to access information related to an error condition from a central database (col. 3 lines 8-11), and determine a possible cause of the error condition based on the accessed

information (col. 3 lines 12-21). Nicholson also teaches a fault detection unit for providing an error signal indicative of an error condition associated with the processing tool of a manufacturing system (col. 3 lines 50-52). However, Nicholson does not explicitly teach an equipment interface comprising a control unit adapted to receiving the error signal provided by the fault detection unit.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to a control unit to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 9, Nicholson teaches the above. However, Nicholson does not explicitly teach that the control unit is adapted to perform diagnostics on the processing tool based on the accessed information.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard

to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to a control unit to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 10, Nicholson teaches that the error condition is associated with processing of a wafer by the processing tool (col. 3 lines 12-21).

Referring to claim 11, Nicholson teaches that the error condition is based on a comparison of metrology data to an acceptable range of values (col. 1 lines 27-34).

Referring to claim 12, see rejection of claim 5 above.

Referring to claim 13, Nicholson teaches that the central database comprises entries regarding classification of the error condition (col. 3 lines 5-11).

Referring to claim 14, Nicholson teaches the above. In addition, Nicholson teaches that the error signal may be combinational (col. 5 lines 22-44, whereby there may be multiple failures by multiple processing tools). However, Nicholson does not explicitly teach receiving an error signal over an APC framework.

Tripathi teaches an equipment interface connected with processing tools and fault detectors connected to an APC framework (Paragraph 0051).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize an APC framework for communications in that taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 15, Nicholson teaches creating an error signal indicative of a fault associated with processing of a wafer in a processing tool (col. 3 lines 50-52), accessing information related to a fault from a central database (col. 3 lines 8-11), and performing diagnostics based on the accessed information (col. 3 lines 12-21). However, Nicholson does not explicitly teach receiving the error signal and performing diagnostics on the processing tool.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to the at least one identified processing tools to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 16, Nicholson teaches that corrective action may be performed to cure the fault indicated by the error signal (col. 3 lines 50-52). However, Nicholson does not explicitly teach that a processor performs the corrective action.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface and the interface can run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have a processor perform corrective action in that taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 17, see rejection of claim 5 above.

Referring to claim 18, Nicholson teaches determining the fault based on metrology data associated with the wafer that is processed by the processing tool (col. 2 line 64 through col. 3 line 11).

Referring to claim 19, Nicholson teaches accessing the central database to retrieve information related to a classification of the fault (col. 3 lines 5-11).

Referring to claim 20, Nicholson teaches the above. In addition, Nicholson teaches that the error signal may be combinational (col. 5 lines 22-44, whereby there may be multiple failures by multiple processing tools).

Referring to claim 21, Nicholson teaches a plurality of processing tools adapted to process a lot of wafers (col. 2 lines 52-58), a fault detection data processing unit adapted to receive metrology data based on the lots of wafers processed by at least one of the processing tools and detect a fault based on the received metrology data (col. 2 line 64 through col. 3 line 11), identify one or more of the plurality of processing tools that processes the lot of wafers (col. 3 lines 12-21), and provide an error signal to an operator based on the detected fault (col. 3 lines 50-52). However, Nicholson does not explicitly teach that the fault detection data processing unit is communicatively coupled to the plurality of processing tools, nor that the error signal is provided to the one or more identified processing tools based on the detected fault.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033) and is communicatively coupled (Paragraph 0030) and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to communicatively couple a fault detection unit to processing tools and to provide an error signal to the at least one identified processing tools to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 22, see rejection of claim 2 above.

Referring to claim 23, see rejection of claim 19 above.

Referring to claims 24-25, Nicholson teaches the system above. However, Nicholson does not explicitly teach that an equipment interface performs diagnostics on the one or more of the identified plurality of processing tools, nor that the equipment interface takes corrective action to cure the fault in at least one of the identified plurality of processing units.

Tripathi teaches a system whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to perform diagnostics and run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have an equipment interface perform diagnostics and take corrective action in the system taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Referring to claim 26, Nicholson teaches means for detecting a fault associated with processing of a workpiece in a manufacturing system having a plurality of processing tools (col. 2 line 64 through col. 3 line 11), means for identifying at least one of the processing tools that processes the workpiece (col. 3 lines 12-21), and means for providing an error signal to an operator to perform diagnostics based on the detected fault (col. 3 lines 50-52). However,

Nicholson does not explicitly teach providing an error signal to the at least one of the identified processing tools to perform diagnostics based on the detected fault.

Tripathi teaches a method whereby each tool involved in a manufacturing system is associated with an equipment interface (Paragraph 0033), and whereby error signals with regard to fault detection are fed back to the equipment interface to run process adjustments to correct the faults (Paragraph 0057).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an error signal to the at least one identified processing tools to perform diagnostics in the method taught by Nicholson since this would provide a simplified method of interfacing between a manufacturing tool and an advanced process control system which provides engineering data collection capability for manufacturing tool process control data without interfering with the communications between the process tools and the equipment interface machine (Tripathi, Paragraph 0008).

Conclusion

4) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ozaki (U.S. Pat 5,940,300) – teaches a method for analyzing a production line.

5) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander J Kosowski whose telephone number is 703-305-3958. The examiner can normally be reached on Monday through Friday, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 703-308-0538. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306. In addition, the examiner's RightFAX number is 703-746-8370.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Alexander J. Kosowski
Patent Examiner
Art Unit 2125

LEO PICARD
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